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measures the dark components of the rock mass. In the norite $F = 19.78$, viz., $\text{FeO} = 7.38 + \text{MnO} = .36 + \text{MgO} = 8.15$, and the remainder of CaO left after subtracting 4.73 CaO (the amount necessary to combine with the 4.73% of Al_2O_3 in group *C*) from 8.65 CaO , the amount shown in the analysis. The relation of the alkalies to one another is indicated by the letter n , which is given a value corresponding to the proportion the Na_2O bears in the analysis to the total alkalies calculated to the unit 10. In the above analysis the Na_2O is to K_2O as 4.23 is to 1.39 , or as 7.5 is to 2.5 . n thus is 7.5 . The formula of the rock is

$$S = 59.50, \quad A = 5.62, \quad C = 4.74, \quad F = 19.78, \quad n = 7.5.$$

In the plotting the absolute values of A , C , and F are not used, but instead their proportions are calculated to a total of 20 units, and these ratios are made use of. The values 5.62 , 4.74 , and 19.78 are as $4 : 3 : 13$ in the scale of 20, and the simplified formula is $s_{59.5}, a_4, c_3, f_{13}, n_{7.5}$. This formula not only expresses the approximate chemical composition of the rock for which it is calculated, but it expresses also roughly the proportions of alkaline feldspars, lime feldspars, and dark components present in it, and from the formula may be calculated the analysis. The ratios $a : c : f$ are represented in a triangular projection by a dot, the position of which discloses at a glance the chemical character of the rock it represents. Rocks of similar composition are represented by groups of dots in certain portions of the triangle, and these groups are observed to fall naturally into subgroups. The discussion of these features is reserved by the author until after he has plotted the effusive rocks. The present paper deals exclusively with rocks possessing the granitic texture. Of these the author has investigated over 200. He has recalculated the proportions of each of the analyses and has plotted them in a series of projections. A final projection contains all the types and thus serves as a summary of the work. Among the rock analyses studied, 40 are of granites, 36 of syenites, 37 of diorites, 28 of eleolite-syenite, 27 of gabbros, 23 of essexites and theralites, 4 of iolites and other rare basic rocks, and 11 of peridotites.

Moses and Parsons,¹ Elements of Mineralogy, Crystallography, and Blowpipe Analysis, etc.—The new edition of Moses and Parsons's *Elements of Mineralogy* covers concisely the greater part of the field of mineralogy. As its title indicates, it not only treats

¹ Moses, A. J., and Parsons, C. L. *Elements of Mineralogy, Crystallography, and Blowpipe Analysis*, from a practical standpoint, including a description of all

of the descriptive portion of the science, but it is also a very brief but quite satisfactory treatise on blowpipe analysis. It contains also a discussion of crystallography and a summary of the principles of physical mineralogy. That the authors have attempted to cover too much ground in the volume might be judged from this summary of its contents. Everything discussed, however, is so concisely put that the parts of the book are fairly well proportioned. The chapters on the optical, thermal, and electrical properties of minerals are so brief that they possess little value. But since these properties are those of least importance to a class of students beginning the study of the science, perhaps this fault is not of practical moment.

In the opinion of the writer the discussions are throughout the book so compactly condensed that it cannot be used successfully as a text-book. There are too many points in it that need amplification. As an accompaniment to a course of lectures on mineralogy, however, it seems to be very well suited. Indeed, it is an excellent book for use in this way. The volume is not as large as Dana's *Text-Book of Mineralogy*, and therefore is better suited to courses extending through half a year; and yet, at the same time, it is not as small in size nor as elementary in the treatment of its subject-matter as are most of the *Elementary Mineralogies* on the market, most of which are entirely without value for class-room purposes.

The changes noted in the new edition as compared with the old one are: the treatment of crystallography according to the newly accepted classification of crystal forms, the addition of about one hundred figures illustrating the combination of forms observed on definite mineral species, the revision of the chapters relating to blowpipe analysis, the addition of a description of the spectroscope and its use, the complete revision of the paragraphs dealing with the economic uses of the different minerals and the simplification of the part devoted to determinative mineralogy.

The book is well printed on good paper. The figures illustrating crystals are for the most part beautifully clear, but most of the woodcuts supposed to represent the appearance of minerals as they actually occur in nature are poor. They might well be omitted without affecting the value of the book a mite.

W. S. B.

common or useful minerals, the tests necessary for their identification, the recognition and measurement of their crystals, and a concise statement of their uses in the arts. New enlarged edition. New York, D. van Nostrand Company, 1900. 413 pp., 664 figs.